

The Debate

Genetically-modified food is fast becoming as controversial as cloning. Critics call it "Franken food" — as in Frankenstein. The debate rages much hotter in Europe than in the United States, but that very fact ensures that the issue makes it into the equations of biotechnology and agriculture companies and government export policy. What is it all about?

What is a genetically modified organism (GMO) or genetically modified food (GMF)?

The main feature of a GMO is that there has been man-made manipulation of the DNA, the genetic structure, of an organism. This does not apply to processes of mutation and natural selection — as in cross-pollination or grafting — but rather the use of biotechnology to alter DNA.

To learn more about the intricate processes of genetic modification please visit:

- [Transgenic Crops: An Introduction and Resource Guide](#)
- [The National Health Museum Graphics Gallery](#)

The Benefits and Risks

There are many complex arguments on both sides of the genetically modified food debate. A short summary of the benefits includes:

- Increased yields
- Herbicide tolerant crops encourage less tilling and less soil erosion
- Insecticidal crops encourage less use of harmful pesticides
- Virus resistant crops
- Development of crops that are drought or salt tolerant
- Development of vaccine or chemical producing plants

Among the risks suggested by GMO opponents are a variety of possible health and environmental problems

- Possible allergic or other health responses in humans and livestock
- Creating new or more vigorous pests and pathogens
- Harm to "non target" beneficial species — soil organisms, helpful insects, birds or other animals
- Unwanted gene flow
- Evolution of super-resistant weeds
- Irreparable changes in species diversity and genetic diversity within a species

For more information on the arguments of all interested parties visit our [Resources](#) section.

Worldwide Discussion

In addition to being a hot issue at the recent Johannesburg Sustainable Development Summit (see our [Earth Debate](#) coverage), GMO is a topic of discussion worldwide. The EU is reviewing GMO import restrictions — whether they end up tighter or looser remains to be seen. Recent headlines tell the story:

"Spanish farmers seen reaping rewards from GM maize." (Reuters)

"Food industry campaigning against Oregon GMO proposal." (WALL STREET JOURNAL)

"China may extend GMO rules." (UPI)

But few debates have received the attention given to hunger-stricken Zambia's refusal of U.S. food aid because it contains genetically modified products. The President of Zambia, Levy Mwanawasa, went so far as to call it "poison."

Observers of the Zambia crisis note that poor countries face a double issue when offered GMO food aid. Because of the reluctance of European and Japanese markets to accept GMO crops and foodstuffs, accepting seed corn may end up costing Zambia future foreign markets.

North Dakota farmers find themselves in a similar dilemma. In 2001 North Dakota Bill HB1338, "A Bill to Impose a Moratorium on Genetically Modified Wheat Seed" came up in front of the state legislature. The bill asked for a two year ban on planting any GM wheat in the state in order to provide time to study possible effects on markets and to prevent gene flow. It was sponsored by

farmers, and it was opposed by farmers. The ban failed, but both groups agreed more study was needed. Just last month another moratorium bill entered the state legislative process.

Now some U.S. companies process their GM and non-GM products separately in order to preserve both markets. Increasingly, the world focuses on laws and labeling — as the GMO issue appears here to stay.

GMF in the World

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| Percentage of U.S. genetically modified commercial crops, 1996: | 0% |
| Percentage of U.S. genetically modified commercial corn, 2002: | 34% |
| Percentage of U.S. genetically modified commercial cotton, 2002: | 71% |
| Percentage of U.S. genetically modified commercial soya, 2002: | 75% |
| Bushels of corn sales lost to Europe due to GM restrictions since mid 1990s: | 300 million |
| Bushels of corn sales lost to Japan due to GM restrictions since mid 1990s: | 100 million |
| Estimated loss in sales in Japanese and European markets mid 1990s: | Half a billion dollars |
| Cost decline of raising GM cotton vs. non-GM cotton: | 25% |
| Amount of pesticide needed by GM cotton vs. non-GM cotton: | 1/6 |

Sources: SCIENCE, THE ECONOMIST, Dan McGuire, ACGA Farmer Choice - Customer First Program (September 14, 2002)